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AUTHOR Hensley, Wayne E.
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ABSTRACT

A study investigated the validity and usefulness of the Affective Communication Test (ACT) which measures a person's ability to project a nonverbal message to others. The ACT test was reduced to 10 items and administered to 130 college students. The results were analyzed for interpersonal display of effect, public display, and small group display. Two hypotheses were generated: (1) the more anxious a person is when communicating verbally, the more inhibited the person will be when communicating nonverbally; and (2) since females are better at decoding nonverbal cues than males, they will score significantly higher than males on the self-reports of affective communication ability. Results indicated that the lack of nonverbal encoding ability is a strong correlate of communication anxiety for both males and females. Also, males and females tend to make the some distinctions of nonverbal affect; therefore, different scales are not necessary for the two genders. The shortened scale, the ACT-10, is brief enough to be administered quickly yet reliable enough to assess accurately the self-report of nonverbal encoding ability. (SRT)

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A New Look at Nonverbal Expressiveness: The Affective Communication Test (ACT-10)

Wayne E. Hensley

Virginia Polytechnic Institute and State University

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ABSTRACT

Building on the research which found the existance of a self-reported ability to project nonverbal messages, this study found a second-order unidimensional structure for such an ability. At the first order of factor analysis, three distinct subsets of nonverbal affect were found: interpersonal, public and small group. While the means differed for males and females on the total scale, both genders showed a strong linear relationship between the display of nonverbal affect and communication anxiety; namely the greater the amount of communication anxiety, the less the ability to project a nonverbal message. It was concluded that the scale possesses sufficient promise to warrant futher investigation. (107 words)

A new Look at Nonverbal Expressiveness:

The Affective Communication Test (ACT-10)

The growing field of nonverbal communication is beginning to amass a rather impressive body of research concerning the impact of nonverbal stimuli in social interactions (Knapp, 1978). However, even a casual review of the literature will reveal that only part of the communication equation has been investigated. The vast majority of nonverbal studies have focused on the effects of nonverbal variables. In other words, the reception of nonverbal stimuli has received a disproportunate amount of attention (Rosenthal, Hall, DiMatteo, Rogers and Archer, 1979), while the ability to send nonverbal messages is virtually unresearched.

In an effort clearly aimed at correcting this oversight, a recent scale has been developed to measure a person's ability to project a nonverbal message to others (Friedman, Prince, Riggio & DiMatteo, 1980). The result of this research yielded a 13 item paper-and-pencil, self-report which appears to have considerable promise. The Affective Communication Test (ACT) seems to have acceptable reliability: Coefficient alpha was .77 and a test-retest correlation was above .90 measured two months apart. Further, Friedman et al. (1980) also found that theatrical experience, ability to impart information in a lecture format, excelling in sales work and so forth all tended to be related to enhanced scores on the ACT. Thus, the scale also appears to have a good deal of external validity since we would intuitively expect to find a relatively high level of nonverbal encoding ability

among individuals possessing such talents. All in all, the ACT seems to be a measure worthy of further study.

The problem inherent in the initial development of the ACT was that data concerning the item selection was not as fully delineated as it might have been. We know, for example, that the 13 scale items were derived from an initial pool of 46 total items. Further, we know that ambiguous items were removed. The difficulty arises because adding the 13 surviving items together to obtain a total score for the scale strongly implies that all 13 items are measuring the same concept. Overwise, adding the scores makes no sense either logically or mathematically. To demonstrate, beyond doubt, the efficacy of a summated score, factor analysis would seem to be required; we must demonstrate a unidimensional structure. This technique was not employed in the original study; it is the primary focus of the present investigation. The research question is: what is the dimensionality of the Affective Communication Test?

Beyond a simple investigation of the ACT itself, it would be instructive to ascertain the relationship of the ACT to other measures of communication. Perhaps the most logical starting point is with another well known self-report of a communication activity: communication anxiety. Since the early beginnings of the concept (McCroskey, 1970), communication anxiety has achieved a rapid and a noteworthy place in the field of speech communication. It would not be unreasonable to expect a link between nonverbal communication ability and verbal communication ability. In essence, we would suspect that: the more anxious a person is in the verbal sphere, the more inhibited the person is also likely to be

in the non verbal sphere.

Friedman et al. (1980, p. 339) also indicated that some sex differences did emerge on the ACT. This finding is not surprising since it is well known that females are better at decoding nonverbal cues than are males (Hall, 1978). Therefore, we might suspect that females would be better at encoding nonverbal cues as well. In the original construction of the ACT, items were not examined for sex differences (Friedman, et al., 1980, p. 339). The use of the factor analysis will allow not only the inspection of the underlying factorial dimensions utilized by each gender, but will also provide a basis for comparison of the magnitude of that self-reported skill as well. Hence, we would hypothesize that females will score significantly higher than males on the self-reports of affective communication ability.

Method

A questionnaire containing the ACT was administered to respondents (N = 130) enrolled in a human communication course at a large south-eastern university. The questionnaire was presented as part of a classroom discussion on the topic of nonverbal communication. In keeping with the cautions of Friedman et al. (1980), the sample of males (N = 59) and females (N = 71) in this study are American college students: the population for whom and on whom the scale was developed. At the same time the ACT was administered, the 10 item version of the Personal Report of Communication Anxiety (McCroskey, 1978) was included as well.

Results and Discussion

We have achieved the ratio of 10 subjects for each scale in the analysis, 13 scale items and 130 respondents, recommended by conservative factor analytic writers (Nunnally, 1967, pg. 355). However, there is still the danger of mis-identifying the factor structure. As Guertin and Bailey (1970, pg. 171) have admonished, a sample size of even 100 should be the basis for only a tentative pilot study. Having a sample of 130 places us on not much better ground.

Fortunately, a recent investigation (Acito & Anderson, 1980) has demonstrated that alpha factor analysis may actually be superior to the standard principle components analysis with samples around 100 or so. Therefore, to be as conservative as possibe, all factoring was done with both principle components and with alpha factor analysis. Further, structures were rotated to both varimax and oblique solutions. Of the 13 items in the ACT, three were discarded because of low initial communalities. The remaining 10 items, the ACT-10, yielded a three-factor solution both when analyzed by principle components and alpha factoring; the same three-factor solution was obtained regardless of whether a varimax or an oblique rotation was used for analysis. Since the solutions are so similar, only the factor loadings for the alpha oblique solution are shown in Table 1.

Insert Table 1 about here

The first factor, explaining 29.8% of the total variance, has strong loadings on items 2, 3, and 10. This factor seems to describe an interpersonal display of affect. The item which states, "I show that I like someone by hugging or touching that person," best seems to illustrate the interpersonal nature of this underlying concept.

The second factor, explaining an additional 14.4% of the variance, has been labeled public display. The items loading strongly on this factor are 4, 5, 6, and 7. This factor is best typified in the statement, "I like to remain unnoticed in a crowd."

The final factor, explaining 10.5% of the variance, is a small group factor of affective display. The items loading strongly here are 1, 8, and 9. The most descriptive item for this factor is, "At small parties I am the center of attention."

In all, the three factors explain a respectable amount of variance, 54.8%, and display a reasonably unambiguous pattern of loadings. At first blush, these results seem to suggest that the ACT-10 is not unidimensional. However, further analysis seems in order after an examnation of the relationship of the three factors to one another.

The oblique solutions for both principle components and alpha revealed an impressive amount of correlation between the three factors. As shown in Table 2, each of these correlations is quite high; these results would indicate a strong underlying pattern among the three factors.

Insert Table 2 about here

It is possible that factor analysis is simply so powerful a statistical tool that it has pulled apart several components of a basically unidimensional concept. This is clearly not to argue that the three factors are an artifice. Rather, the issue is whether there is a higher order structure of which interpersonal, public and small group affective displays are simply components. Fortunately, it is possible to answer this question with second-order factor analysis (Guerten & Bailey, 1970). The correlation matrix produced by the oblique solution (Table 2) is entered as raw data and is itself factor analyzed. In essence, we are factor analyzing the factor analysis.

As suspected, a clear one-factor solution emerged from the second-order factor analysis. In this instance, with only one factor, rotation makes no sense so the solution shown in Table 3 is technically neither varimax nor oblique. Further, the factor loadings of the alpha and the principle components solution are identical to the second decimal place. The solution(s) are shown in Table 3.

Insert Table 3 about here

Heartened by the finding of a second-order underlying structure, we returned to the original data and called for a one-factor solution. As shown in Table 4, a one-factor solution makes perfectly good sense and has an acceptable set of loadings for an exploratory study such as this one. Once more, the alpha and the principle components solutions did not differ. The alpha loadings are shown in Table 4.

Insert Table 4 about here

The answer to our first research question is now clear. The ACT-10 is unidimensional scale, at least at the second-order level of factor analysis. There are, however, three distinct components of the ACT-10 at the first order of factor analysis: interpersonal affect, public affect and small group affect. As a consequence, the issue of additivity is more clouded than clear. If a researcher were willing to accept the inaccuracies of glossing over the three components of the ACT-10 for the sake of obtaining a global measure, a total score would make both theoretical and mathematical sense. If, on the other hand, a researcher were a strict constructionist, only the three components would be used. The question is no closer to a solution than it was when this study began, but now at least the dilemma is a bit more sophisticated.

Sex differences

However equivocal the answers provided above, they do allow the investigation of sex differences on the ACT-10 in a rather straightforward manner. The scores for males and females were calculated for each of the components of the ACT-10 and for the total score. As shown in Table 5, there are some differences. Males and females do differ on the total score obtained on the ACT-10 in accordance with the prediction made earlier ($t = 2.12$; $df = 128$; $p < .03$). That is, the mean score for females for the total scale was 55.86 while the same score for males was 51.39.

In spite of the difference observed between males and females for the total scores, similiar differences were not repeated across all three component parts of the ACT-10. There were no significant differences on the public report of affect; the mean for females was 20.64 while it was 19.93 for males (t = .52; df = 128; p is n. s.). Nor were the differences significant for small group affect--females: 15.44 vs. males: 16.94 (t = 1.81; df = 128; p is n. s.). The striking difference occurred on the interpersonal report of affect. On this set of items, females scored 18.99 while the males trailed at 15.31 (t = 4.35; df = 128; $p < .001$). In short, the primary reason there is a difference on the total scale score is because of the rather substantial difference between males and females on the interpersonal items. The magnitude of these two differences may be compared by observing that the variance explained by the relationship of sex and the total scale score is less than 5 percent (r^2 = .034) while the amount of explained variance in the sex-interpersonal relationship is more than 10 percent (r^2 = .129).

Given these findings, it seemed prudent to factor the total ACT-10 once more to ascertain if not only the magnitude but the dimensionality of nonverbal displays differed by gender. As shown in Table 4, there is no data to support the hypothesis of a differing dimensionality for males and females. Thus, while the dimensions on which males and females perceive their respective nonverbal sending abilities are similar, females report they have more ability than do males.

Reliability

The reliability of the original ACT with 13 items was reported to be

.77 using Coefficient alpha. The next logical question was whether the ten-item version examined here (ACT-10) maintained the same standard. Coefficient alpha for the ACT-10 was measured at .73. The standard error of measurement for the observed value of Coefficient alpha would be about 6.0 (Gronlund, 1965, pg. 89). Since the original reliability falls within this range, .73 $\pm$ .06, there is no reason to believe we have seriously impared the usefulness of the measurement of nonverbal affect. The ACT-10 is at least as reliable as the original ACT of 13 items.

Relationship to other variables

Finally we come to the issue of how the ACT-10 inter-relates with other communication variables. Specifically, it was predicted that persons who report that they suffer from verbal communication anxiety would also report that they were less proficient as encoders of non-verbal messages. This hypothesis received strong support for both females (r = -.571; $p < .0001$) and for males (r = -.591; $p < .0001$). An examination of the scattergrams for both genders revealed clear linear patterns. By visual inspection it was possible to rule out any non-linear trends e. g., a J-skew or an L-skew: the relationship is a virtual straight line. In general, then, as persons report increasing amounts of communication anxiety, they also report a decrease in their ability to project nonverbal messages.

It is now clear that the lack of nonverbal encoding ability is a strong corrolate of communication anxiety for both males and females. It would be erroneous, however, to assume that the ACT-10

and the PRCA are simply two measures of the same dysfunction. We know from the present study that males and females differ on the ACT-10; we know from past research (McCroskey, Simpson and Richmond, Note 1) that males and females do not differ on communication apprehension. It is more likely that the ACT-10 and the PRCA are sister measures of a general communication problem. This line of reasoning suggests that verbal and nonverbal abilities are probably similar but hardly isomorphic talents.

Overview

This paper has demonstrated a number of important findings. First, there seems to be a sound basis for continuing the search for a generalized ability in the encoding of nonverbal stimuli. Moreover, the ACT-10 is capable of providing a fairly good approximation of such nonverbal abilities. For investigators interested in the specific subsets of interpersonal, public, or small group affect, subscales now exist.

It is also now clear that males and females tend to make the same sorts of dimensional distinctions of nonverbal affect; this finding means that different scales are not necessary for the two genders. However, since the magnitude of nonverbal sending ability is reported to be higher for females, separate analyses by gender are probably prudent for future investigations.

Finally, we have demonstrated a strong linear relationship between self-reported dysfunctions on the verbal and the nonverbal levels. Almost a third of the variance of one dysfunction is predictable with a knowledge of the other. The strength and direction of this relation-

ship further increases the confidence in the ACT-10 since these data are so intutively appealing.

All in all, the results of this study tend to corroborate and extend the earlier findings concerning the measurement of affective communication (Friedman, et al., 1980). The shortened scale, the ACT-10, developed here is brief enough to be quickly administered yet reliable enough to accurately assess the self-report of nonverbal encoding ability. In sum, this seems to be a concept whose time has come together with a scale for its measurement.

Reference Notes

1. McCroskey, J. C., Simpson, T. J., & Richmond V. P. Biological sex and communication apprehension. Paper presented at the Eastern Communication Association Meeting, Pittsburg, PA.: April, 1981.

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TABLE I

Three - Factor
Alpha Oblique Factor Loadings for the
ACT - 10

	FACTOR		
	I	II	III
1) When I hear good dance music, I can hardly keep still.	.19	-.06	.34
2) I can easily express emotion over the telephone.	.43	-.02	-.06
3) I often touch friends during converstions.	.61	-.09	.15
4) I dislike being watched by a large group of people.	.04	.57	-.02
5) I usually have a neutral facial expression.	-.08	.31	-.14
6) I like to remain unnoticed in a crowd.	-.14	.78	.17
7) I am shy among strangers.	.08	.52	-.11
8) I am able to give a seductive glance if I want to.	.14	.04	.42
9) At small parties, I am the center of attention.	-.12	-.12	.76
10) I show that I like someone by hugging or touching that person.	.72	.04	.13

TABLE II

Corrlation Among Factors of the ACT-10

	I	II	III
I	1.000		
II	-.275	1.000	
III	.405	-.425	1.000

Legend:

I = Interpersonal
II = Public
III = Small Group

TABLE III

Second-order Factor Analysis of the ACT-10

Interpersonal	.512
Public	-.537
Small Group	.791

TABLE IV

Single Factor Structure of ACT-10

	Total Sample (N=130)	Males Only (N=59)	Female Only (N=71)
1) When I hear good dance music, I can hardly keep still.	.44	.40	.42
2) I can easily express emotion over the telephone.	.29	.25	.25
3) I often touch friends during conversations.	.61	.59	.56
4) I dislike being watched by a large group of people.	-.40	-.50	-.46
5) I usually have a neutral facial expression.	-.44	-.33	-.53
6) I like to remain unnoticed in a crowd.	-.50	-.43	-.64
7) I am shy among strangers.	-.43	-.47	-.46
8) I am able to give a seductive glance if I want to.	.41	.43	.38
9) At small parties I am the center of attention.	.56	.65	.50
10) I show that I like someone by hugging or touching that person.	.56	.54	.52